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## ORIGINAL ARTICLE

# Defining and measuring 'eczema control': an international qualitative study to explore the views of those living with and treating atopic eczema

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## Abstract

**Background** Atopic eczema (also known as eczema) is a chronic, inflammatory skin condition that often afflicts patients' health and well-being. The Harmonising Outcome Measures for Eczema (HOME) initiative recommends that 'long-term control of eczema' is measured in all clinical trials 3 months or longer in duration. However, little has been published on what eczema control means to those living with or treating atopic eczema.

**Objectives** To (i) develop understanding of what eczema control means to patients, carers and clinicians and (ii) explore the feasibility and acceptability of different ways of measuring eczema control in the long term.

**Methods** Online focus groups explored patients/carers experiences in the UK, the United States, the Netherlands, France, Sweden and Japan, and an international online survey gathered views of clinicians. The framework method was used to analyse the focus groups, and thematic analysis was used to analyse survey data. All findings were integrated into a theoretical framework to create overarching themes that cut across these diverse groups.

**Results** Eight focus groups with patients (16 years+) and eight groups with carers of children took place ( $N = 97$ ). Sixty-two people took part in the survey. Eczema control was described as a multifaceted construct involving changes in disease activity, the treatment and management of the condition and psychological, social and physical functioning. Patient/carer measurement allows personal accounts and frequent measurement, whilst clinician measurement was deemed less subjective. The burden on patients/carers and issues for analysing and interpreting data should be considered.

**Conclusions** This study formed the basis of judging the content validity and feasibility of measurement instruments/methods to assess control of eczema in clinical trials. This online approach to an international qualitative study is an example of how core outcome set developers with limited resources can engage with multiple stakeholder groups on an international basis to inform consensus meeting discussions.

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## Conflict of interest

All authors are members of the Harmonising Outcome Measures for Eczema (HOME) initiative. Dr Barbarot has received research grants from Pierre Fabre Laboratory and Fondation pour la dermatite atopique; personal fees from Bioderma, Laboratoire La Roche Posay, Sanofi-Genzyme, Leo Pharma and Abbvie; and non-financial support from Abbvie, Novartis and Janssen.

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## Introduction

Atopic eczema (syn: eczema, atopic dermatitis) is a chronic, inflammatory skin condition characterized by periods of remission and relapse.<sup>1</sup> An international survey found that 75% of patients and caregivers rated being able to effectively control their eczema as the most important factor contributing to an improvement to their quality of life.<sup>2</sup>

The Harmonising Outcome Measures for Eczema (HOME) initiative is an international collaboration developing a consensus and evidence-based core outcome set for atopic eczema clinical trials.<sup>3–7</sup> The HOME initiative recommends that 'long-term control of eczema' is measured in all clinical trials 3 months or longer in duration.<sup>3,5</sup> The first step for HOME to be able to recommend instrument(s) to measure this domain was to conduct international studies to gather patient and clinician perspectives on long-term control of eczema.

Content validity is essential for an instrument to be selected for inclusion in a core outcome set and is defined as 'the degree to which the content of a health related patient reported outcome instrument is an adequate reflection of the construct to be measured'.<sup>8,9</sup> A key initial step in establishing content validity is defining the construct to be measured. A construct is differentiated from a general concept, as it is a well-defined subject of measurement that has a clear and precise meaning.<sup>10</sup> A conceptual model of the construct is then developed to allow judgement of whether an instrument adequately reflects the concepts relevant to the construct of interest.<sup>9</sup> Qualitative research helps to build a definition of a construct that authentically and comprehensively reflects patient experiences.<sup>11</sup>

This study aimed to facilitate evidence-based discussions within HOME about how to define and measure 'long-term control of eczema' and enable assessment of the content validity of existing outcome measurement instruments. The study objectives were (i) to understand what long-term control of eczema means to people living with atopic eczema (including adults with eczema and parents/carers of children with eczema) and people treating eczema (clinicians/researchers) and (ii) to explore the potential feasibility and acceptability of different ways of measuring long-term control of eczema.

## Methods

### Study design

To obtain the perspectives of patients/carers and clinicians treating atopic eczema, online focus groups and an online survey were carried out respectively.

### Online focus groups with patients/carers

**Participant selection** Adults with eczema and parents, legal guardians or carers of children with eczema were included in the online focus groups, hereafter referred to as patients/carers for brevity. The term 'patients' refers to people who are seeking or receiving health care.<sup>12</sup> As we recruited through a variety of different platforms and not necessarily healthcare settings, participants in these studies could more correctly be referred to as 'people with eczema'. However, we sometimes refer here to 'patients' for brevity. The sampling strategy aimed to purposefully include a diversity of participants regarding age, sex, ethnicity, eczema severity and disease duration, but convenience was also a factor.<sup>13</sup> Recruitment was via social media or approaching patients in clinics and varied by country (See Table S1 in Supplementary Materials for details of methods by country).

**Procedures and materials** Online focus groups were conducted via text-based chat room websites between August 2016 and June 2017 in the UK, the Netherlands, France, Sweden, the United States and Japan. Local teams conducted the data collection in their own country and native language, supported by the UK team, following the format of the initial UK-based focus groups. Full details of the procedure of the UK focus groups have been described elsewhere.<sup>14</sup> Table S1 in Supplementary Materials highlights key aspects of the procedure for each country. Each focus group followed a common semi-structured topic guide that was developed by the UK-based authors (Figure S1 in Supplementary Materials). Questions were open-ended, for example, 'How would you decide if a treatment has been working well or not?' and followed up with prompts to elicit further information from participants. The term 'long-term control' was initially

avoided by the facilitators to allow individuals to refer to this concept using language that was meaningful to them.

**Analysis** The principles of framework analysis were used to analyse the transcripts thematically.<sup>15</sup> Framework analysis is a method that sorts data into key themes using the five steps of familiarization, identifying a theoretical framework, indexing, charting, and mapping and interpretation.<sup>15</sup> Each country used a thematic framework to map findings to the subthemes that were based on the findings from the UK focus groups and also highlight findings that did not fit within the framework.<sup>14</sup> This was done in the native language of the researchers. The detailed UK findings were not shared with the other groups until they had analysed their findings. A summary and key quotes were produced in English by each country. The UK team collated and compared the data from all countries in a thematic framework. Any areas of uncertainty were discussed with the researchers who collected the data.

### Online survey of HOME membership

**Participant selection** All members of HOME were invited to participate. HOME is an open-invitation, international, multi-stakeholder group including clinicians (mainly dermatologists), methodologists, patients, patient representatives and the pharmaceutical industry (<http://www.homeforeczema.org/>).

**Materials and procedures** This online survey took place during September and October 2016 using SurveyMonkey Inc. software.<sup>16</sup> Using mainly open questions with free-text responses, participants were asked what they considered to be long-term control of eczema and their views on different ways of measuring long-term control (Figure S2 in Supplementary Materials) identified from a systematic review.<sup>17</sup>

**Analysis** Thematic analysis was used to analyse textual data.<sup>18</sup> J.R.C. compiled the themes and I.N. and L.H. reviewed the themes, which were then discussed and revised.

### Combining the focus group and survey findings

L.H. and J.R.C. combined the themes from the online patient/carer focus groups and the clinician survey into an overarching thematic framework. These themes were then compared with original data sources and initial coding confirmed with all authors.

## Results

### Participant characteristics

Sixteen online focus groups took place including 97 patients/carers across six countries. Table 1 provides participant demographics.

Sixty-two out of 251 HOME members from sixteen countries completed the online survey, a response rate of 25%. Most (81%) were clinicians, plus five methodologists/non-clinical researchers and seven patient representatives. Since this survey principally represents the views of clinicians, this group is hereafter referred to as clinicians for brevity. Sixteen countries across six continents were represented (Fig. 1).

### Overarching themes

The results can be structured into two overarching themes: (i) long-term control as a multifaceted construct and (ii) long-term control is complex to measure. Illustrative quotes that link themes to the data are presented in Tables 2 and 3.

**Long-term control as a multifaceted construct** Most participants described multiple related aspects of atopic eczema when thinking about 'what is long-term control of eczema?' which divide into four key subthemes (Fig. 2).

**Long-term control as disease activity.** Patients/carers and clinicians frequently described long-term control as a reduction in disease activity. Signs and symptoms such as the level of itch, pain and redness were often mentioned, although patients with more severe atopic eczema were also concerned about complications such as infection and bleeding. Clinicians used terms such as reduced intensity, minimal signs and/or symptoms or minimal disease activity. Differences in some symptoms by country were noted, for example only participants in France discussed 'smoothness of skin' as an indicator of control.

Disease activity in relation to flares of activity was also described. A reduction in the intensity, number, frequency and duration of flares was all parameters suggested as indicators of disease control. However, the concept of 'flares' was not seen as universally useful, as a flare was difficult to define and did not always correlate with disease activity. For example, those with a continually high level of disease activity may not experience flares, despite having uncontrolled atopic eczema.

**The experience of long-term control goes beyond the skin.** A positive impact on daily activities was considered important to patients/carers and clinicians. Patients/carers reported a wide range of daily activities that were affected by atopic eczema, but these varied amongst countries. For example, in the UK, washing, exercise and clothing choice were discussed, whereas in Japan, it was disturbance of concentration whilst reading books and watching TV. Scratching, sweating, pain, sleep disturbance and lack of ability to concentrate were amongst the ways that patients and carers described atopic eczema having an impact on their daily life.

The emotional impact of uncontrolled eczema was raised by patients/carers, who often reported high levels of distress when eczema was uncontrolled. Feeling frustrated, miserable and

**Table 1** Demographic info of online focus group participants

	UK	The Netherlands	France	Sweden	USA	Japan	All countries
Participants, <i>N</i>	37	15	9	15	8	13	97
Patients, <i>N</i>	19	7	5	7	4	10	52
Parents, <i>N</i>	18	8	4	8	4	3	45
Focus groups, <i>N</i>	6	2	2	2	2	2	16
<b>Self or parent-reported sex, <i>n</i></b>							
Male	13	6	4	4	0	8	35
Female	24	9	5	4	8	5	55
Unknown	0	0	0	7	0	0	7
<b>Self or parent-reported age in years, <i>n</i></b>							
≤5*	12	5	0	4	0	2	23
6–11*	5	1	4	2	3	1	16
12–15*	0	2	0	2	1	0	5
16–25	7	0	0	2	3	4	16
26–40	6	1	2	2	0	0	11
40	6	6	3	2	1	6	24
Unknown	1	0	0	1	0	0	2
<b>Self or parent-reported ethnicity, <i>n</i></b>							
White	33	14	9	15	4	0	68
Asian	1	0	0	0	2	13	15
Black	0	0	0	0	1	0	1
Mixed	3	1	0	0	1	0	5
Unknown	0	0	0	0	0	0	0
<b>Self or parent-reported years since eczema diagnosis, <i>n</i></b>							
≤5	13	5	1	5	0	3	27
6–11	6	1	3	2	3	0	15
12–15	0	2	0	1	0	2	5
16–25	6	0	2	3	4	4	19
26–40	5	2	1	3	0	2	13
>40	5	5	1	1	1	2	15
Unknown	2	0	1	0	0	0	3
<b>Self or parent-reported current disease severity, <i>n</i></b>							
Clear	2	0	1	0	0	0	3
Almost clear	4	2	2	3	0	2	13
Mild	8	4	5	7	1	4	29
Moderate	16	5	1	3	3	4	33
Severe	6	4	0	1	4	3	18
Very severe	1	0	0	0	0	0	1
Unknown	0	0	0	1	0	0	1

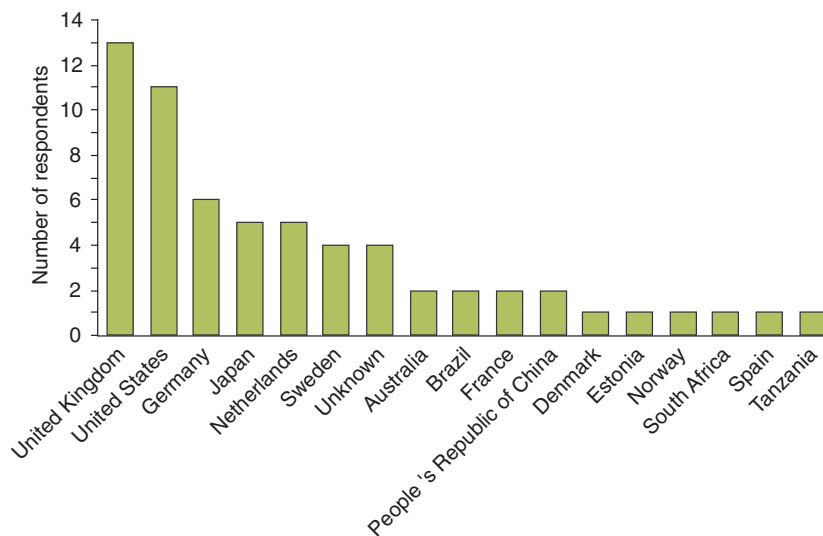
\*Participants were carers for all aged under 16 years.

'stressed' when eczema was uncontrolled, apprehensive about the return of flares and the social impact on patients and their families were all mentioned. Feeling embarrassed or receiving comments from others were discussed, particularly when the eczema was on a visible area such as the face. Some patients/carers felt that eczema controlled their lives and prevented social activities, such as visiting friends and family and school attendance. Clinicians also described the impact of uncontrolled eczema on patient's quality of life.

*Long-term control linked to treatment and management decisions.* Long-term control was also linked to treatment use by

patients/carers and clinicians in all countries. Reducing treatment and returning to maintenance treatment were indicators of regaining control. Using only maintenance treatment and ability to self-manage were indicators of ongoing control. Seeking help from a doctor, stepping up treatment and increasing the amount or frequency of treatment were all described as indicators that the disease was uncontrolled.

*Control is an individual experience.* Control of eczema was largely considered to be an individual experience. Individual patients/carers reported different aspects of the disease as being representative of a lack of control, such as specific symptoms,



**Figure 1** Country of residence for online survey respondents.

the need to increase treatment or the impact on particular aspects of life. The level at which disease activity or impact represents control varied between individual patients/carers. Some expressed that feeling the eczema has ‘completely receded’ would represent control, whereas for others, a reduced and acceptable level of disease activity was considered controlled. Clinicians often linked control to being what is acceptable to the individual patient such as ‘can live with’ or that is ‘acceptable to the patient’.

**Long-term control is complex to measure** Patients/carers and clinicians also discussed what they felt was important when measuring long-term control, and the sometimes opposing views reflect the complexity involved in measuring this multidimensional construct.

**Who should measure long-term control? Experience vs. standardization.** The majority of patients/carers felt strongly that they were best placed to understand and measure their own (or their child’s) eczema and could measure disease activity between visits to their doctor. Some patients/carers felt clinicians should also measure the eczema, as they have expertise, experience and are less likely to be subjective. Clinicians acknowledged the importance of patient-reported outcomes as an important way of capturing aspects of the disease that cannot be assessed by a clinician, but for measuring long-term control in clinical trials, they were also concerned about potential for bias, reproducibility and scientific acceptability, and discrepancies between patient-reported and clinician-reported outcomes. These findings point to a trade-off between measuring aspects of control that only patients/carers can assess that captures their everyday experience versus having a more standardized method of

measuring long-term control that can be assessed by independent observers.

**The burden and feasibility of measuring long-term control.** Many patients/carers raised concerns about the time and effort required to measure long-term control comprehensively, whereas some, particularly parents of children with eczema, were prepared to go to great lengths to ensure that the level of control was captured accurately and frequently. Clinicians also highlighted the potential burden of frequent measurement on patients/carers resulting in the generation of large amounts of potentially redundant data. In the United States, the Netherlands and the UK, patients/carers discussed the role that technology such as smartphone applications and photographs could help them measure their eczema more frequently and for long periods of time.

## Discussion

This study suggests atopic eczema control is a multifaceted construct involving changes in the signs and symptoms of eczema, psychological, social and physical functioning, and the treatment and management of the condition. Indicators of control and the acceptable level of control can vary between individuals. Both patient-reported and clinician-reported outcomes were considered important when measuring atopic eczema control.

The multidimensional nature of atopic eczema control is reflected in a systematic review of how long-term control has previously been captured in clinical trials.<sup>17</sup> Ninety-one per cent of trials captured long-term control by including repeated measurement of outcomes, such as clinical signs, quality of life and itch, whilst the use of atopic eczema medications or flares (most commonly measured as time to first

**Table 2** Illustrative quotes for Theme 1

<b>Theme 1: Long-term control is a multifaceted concept</b>		
<b>Subthemes</b>	<b>Illustrative quotes (patients/carers)</b>	<b>Illustrative quotes (clinicians/researchers)</b>
<b>(1a) Disease activity</b>		
Improved signs and symptoms	I feel long-term control means less pain, less itch, less scratch – adult, Japan	Achievement and maintenance of a low level of symptoms and signs of AD over time – clinician, Germany
Flares	My skin really hates me. Usually when it has completely receded, I am still waiting for this eczema to die down completely. – adult, UK	A treatment plan that prevents flares for a longer period of time (years) – Clinician, Denmark
<b>(1b) Beyond the skin</b>		
Emotional impact	Her whole demeanour changes too – weepy, fiery temper, generally sad. – carer, UK In case of big flare, my skin gets worse and worse spontaneously even though I do not scratch. I feel quite depressed in this process – adult, Japan	
Social impact	Children at school can be quite unkind when it's sore looking – carer, UK How they interact, their developmental markers, how much socialisation they get, for us when his skin is bad it's the socialising and getting out of the house that suffers – carer, UK	Re-establishment of normal sleep patterns Re-establishment of normal social activities and ADLs [activities of daily living]. Re-establishment of normal family dynamics – clinician, South Africa
Family impact	'center of our lives' –carer, USA	
Effect on my day (including the impact of scratching and loss of concentration)	I would say how much I feel my eczema is bothering me in everyday life, what you might be doing differently because of your eczema – adult, UK and then I'd spend my time staring into space, itching, feeling sorry for myself and unable to snap out of it – adult, UK Permanent sensation of scratching non-stop – adult, France	Living with eczema of a tolerable level without flares that start to interfere with work and play – clinician, UK Increase in symptoms, itching, scratching behaviour that may impact on daily activities/sleep and quality of life. – clinician, UK
Sleep disturbances	It's important to me to create more rest in the long-term and to be able to sleep well. Then I have more energy to do my daily things – adult, The Netherlands How much trouble I have, for example, I get a problem with sleep when the eczema is at its worst – adult, Sweden	Disease improvement that no longer affects sleep and daily function that lasts for more than 6 months – researcher, US
<b>(1c) changes in treatment and management</b>		
Using only maintenance treatment	can return to normal maintenance routines – adult, UK	No itch; controlled by emollient only. –clinician and researcher, Japan
Stepping down treatment	... I realize long-term control by frequency of TCS application. While maintaining by tapering frequency of TCS, I recognize long-term control by no flare despite less frequent TCS. – adult, Japan	The end of using the rescue medication, because overall disease severity is back to pre-flare levels. – clinician, Germany
Self-management of the eczema	I guess so. We see the doctor more during a bad patch, but when I can manage it at home we see him less. I only go to him if I need him when it's beyond me level of helping. – carer, UK	Self-management of control of eczema flares – researcher, Germany
<b>(1d) An individual experience</b>		
A level of eczema acceptable to me	I think everyone has his own definition of 'control'. For me the bar is set fairly low. I will have itch every day and I accept it. As long as it's not constantly there. – Adult, Netherlands	Over time I have been taught by patients that individually, patient satisfaction with their skin and the treatments used varies enormously and what for me as a clinician is poor control is entirely acceptable for a patient who has reached a level of control that they feel manageable and which does not interfere with their life style psychosocial health or general health (read adverse effects especially). How does one integrate measures of this sort into trials and give them meaning? – clinician and researcher, South Africa

Some quotes have been translated into English from another language. Spelling and grammar have been edited for ease of reading.

flare or number of flares) was reported in approximately a quarter of trials.<sup>17</sup> Although clinical trials have captured individual subdomains identified in this study as being important

to patients/carers and clinicians, long-term control has not routinely been captured as a unified construct using a single instrument.



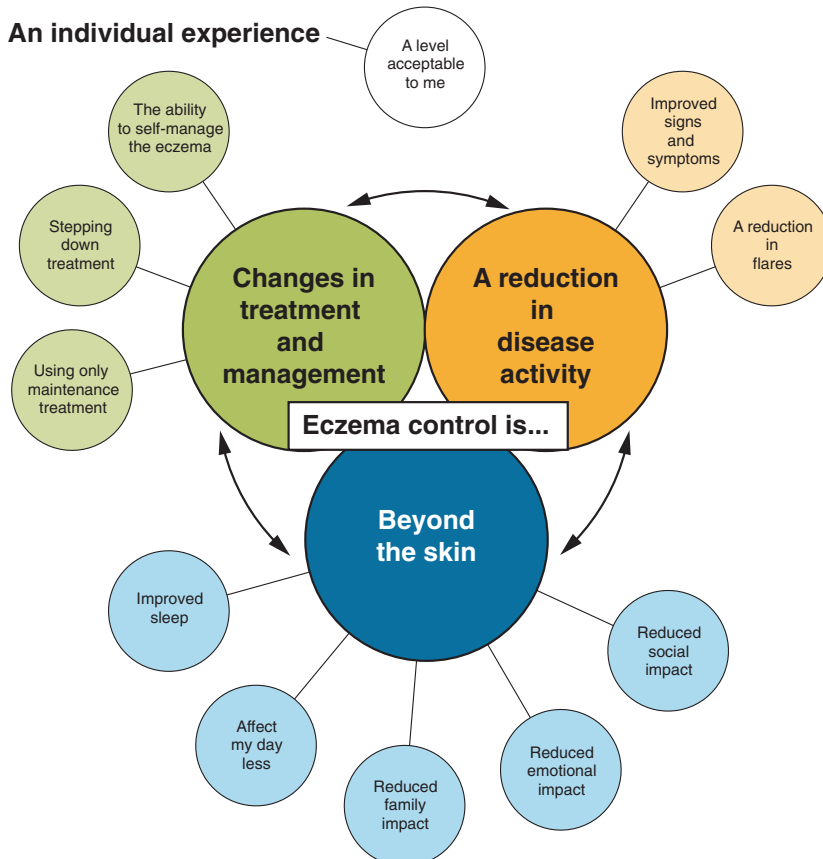
**Table 3** Illustrative quotes for Theme 2

Theme 2: Long-term control is complex to measure		
Subthemes	Illustrative quotes from patients/carers	Illustrative quotes from clinicians/researchers
<b>(2a) Who measures long-term control</b>	You know your own body and eczema best, a doctor has expertise and experience. – adult, The Netherlands Has to be you. SO subjective a topic, and nurses' [and] doctors can only observe so much – and not the effects it has personally! –adult, UK	Recording of observed signs in parallel with patient-reported symptoms and QoL will add information. Taken together, these measures would probably be judged by many as more robust and valid. – clinician and researcher, Sweden These measures might be more standardized across a population. – clinician and researcher, United States
<b>(2b) The burden and feasibility of measuring long-term control</b>	Again it depends on each child, but certainly more frequently than the usual 3 months between consultant visits; we can be fine in the morning as horrendous by bedtime. – parent, UK I do not want to observe every bad aspect of my skin, as it makes me depressed. I never want to take a picture of worsening skin. I think we should look at the better aspects. – adult, Japan The time interval might depend on individuals needs and severity of eczema. – adult, Sweden	Motivation of patient to describe regular frequent diary is needed. Reliability that the patient regularly and surely describe each outcome is doubtful. – clinician, Japan [Discussing concept of well-controlled weeks] Difficult to define/assess, Might be difficult to assess in a standardised way and might result in difficulties to merge data/compare trials – clinician and researcher, Sweden

Some quotes have been translated into English from another language. Spelling and grammar have been edited for some quotes for ease of reading.

There is no agreed definition of an eczema flare, although many definitions have been proposed and used in trials often with little validation.<sup>19,20</sup> However, our study suggests that

eczema control should be viewed by patients/carers and clinicians as a broader concept than these previous definitions. Furthermore, we identified how treatment escalation in response to

**Figure 2** What does atopic eczema control mean to patients, parents and clinicians?



a loss of control is subject to differences between individuals depending on their access to healthcare resources, concerns they may have about using certain treatments and the type of treatment (i.e. topical or oral) that they are using.

The variability between patients regarding the level of control considered to be acceptable, highlighted by both patients/carers and clinicians, presents a challenge for measuring eczema control. What constitutes control for an individual with eczema may be driven by their expectations of the disease course, their treatment and the degree to which they have accepted having the disease and the lack of a cure. It is possible that expectations about the level of disease control in eczema may be altered in the future by advances in treatments. It is important to consider how the expectations of the patient/parent may impact measures of eczema control. For a patient/parent-reported outcome, there may be changing standards depending on level of adjustment to the condition.

Both patient/carer and clinician-reported outcomes were considered important in the measurement of eczema control. There is an increasing acceptance within the medical community of patient-reported outcome measures and a patient-centred approach to health care, and a review showed that patient/parent-reported symptoms were reported in 78% of atopic eczema clinical trials.<sup>21</sup> However, with both patient-reported and clinician-reported measures, consideration of the burden and feasibility of measurement is needed.

### Strengths and limitations

This study was a pragmatic approach to collecting qualitative data on an international scale from a range of stakeholders. The innovative online approach provides a low-cost and rapid alternative to other more traditional methods of opinion gathering such as face-to-face focus groups, whilst still creating a supportive environment where discussion could be prompted. However, one challenge with the online data collection is that the responses could be brief. The learning from the initial UK-based online focus groups was shared with other authors running the subsequent online focus groups in other countries to elicit more detailed responses and prompt a coherent discussion amongst participants.<sup>14</sup> A convenient online survey using mainly open-text responses was used to gain the clinician perspective. This method was considered appropriate because HOME members are familiar with the concepts being discussed and responses were generally clear and relevant. Only 25% of the HOME membership took part in the survey, and it is possible that views may not have been representative of the entire HOME membership. However, the findings from this study informed decisions at the next HOME meeting, therefore allowing HOME members who did not participate in the survey further opportunity to input into HOME consensus decisions.

Although the sampling was partially convenience-based due to restraints on time and resources, participants with diverse

characteristics were still included. However, people with mild atopic eczema and primary care practitioners treating atopic eczema were under-represented. These two groups respectively constitute the majority of people with eczema and deliver the majority of atopic eczema care.<sup>22</sup> The availability of resources also resulted in a predominance of participants in Western countries, and further efforts are needed to engage patients, parents and clinicians across different continents to ensure the cross-cultural validity of the HOME initiative's recommendations.

### Implications and future directions

To our knowledge, this is the first international qualitative study to investigate what long-term control of eczema means to patients, carers and clinicians. It provides evidence for developing a standardized, consensus-based definition of long-term control of eczema by the HOME core outcome set initiative. The implementation of the core outcome set will allow standardization of measures across atopic eczema trials and increase the ability to synthesis and compare results across multiple trials.

Understanding long-term control from different stakeholder perspectives will lead to improvements in how long-term control is measured in clinical trials. This study directly informed discussions about the content validity and feasibility of different methods of measuring long-term control at the HOME V consensus meeting, allowing the HOME group to move towards consensus on standardizing the measurement of this domain.<sup>7</sup> Those assessing the quality of existing measurement instruments or developing measurement instruments of atopic eczema control could use the findings of this study to inform decisions about the content validity of the instrument. The results of this study are currently being used to inform the development of an eczema control instrument. Although this study was aimed to inform measurement of eczema control in clinical trials, it may also be appropriate to inform measurement in routine clinical settings.

### Conclusions

Patients, carers and clinicians across multiple countries view long-term control of eczema as a multifaceted construct involving changes in disease activity, the treatment and management of the condition and psychological, social and physical functioning. This online approach to an international qualitative study is an example of how core outcome set developers with limited resources can engage with multiple stakeholder groups on an international basis to inform consensus meeting discussions.

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## Supporting information

Additional Supporting Information may be found in the online version of this article:

**Table S1.** Focus group methods by country.

**Figure S1.** Summary of topic guide used for focus groups.

**Figure S2.** Summary of the HOME membership survey.